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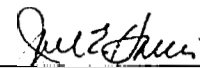
TO: THE CITY COUNCIL	COUNCIL MEETING DATE	NO.
FROM: THE CITY MANAGER'S OFFICE	DECEMBER 20, 1989	
SUBJECT: SPECIFICATIONS AND ADVERTISEMENT FOR THE PURCHASE OF EIGHT 1200 KVAR CAPACITOR BANKS		

RECOMMENDED ACTION: That the City Council approve the specifications and authorize advertisement for bids for the purchase of eight 1200KVAR Capacitor Banks.

BACKGROUND INFORMATION: The capacitor banks are planned for installation at various locations throughout the city to increase electrical system capacity and to maintain high service levels during periods of peak demand.

The estimated cost of this purchase is \$35,000, with delivery expected about 10 weeks after placement of order. Funding is available in the Electric Utility Department's Operating Fund.

The bid opening is set for Monday, January 8, 1990.



Joel E. Harris
Purchasing Officer

cc: Electric Utility Oirector
Assistant Electric Utility Director
Electrical Engineer

EQUIPMENT SPECIFICATIONS

12- KV CAPACITORS

A. GENERAL

Capacitor banks shall be rated 1200 KVAR and be utilized on a 12.0-kv (nomina?) system. The banks shall consist of six (6) individual, two (2) bushing, 7.2-kv, 200 KVAR single-phase capacitors connected in a floating (ungrounded) Wye.

B. REQUIREMENTS FOR CAPACITOR UNITS

1. Capacitor units shall be manufactured and tested in accordance with ANSI Standard C55.1 (latest revision) and ANSI Standard C55.2 (latest revision).
2. Ratings - Each individual capacitor shall be rated as follows:
 - 200 KVAR (nominal)
 - 7200 volts
 - 95-kv Bil (minimum)
3. Construction - Each individual capacitor shall be constructed as follows:
 - Paint Color: ANSI 70 Gray
 - Capable of mounting with NEMA standard 15.62" centers.
 - Bushing creepage shall be 10" (minimum).
 - Each bushing shall include an insulating terminal cover.
 - Capacitors shall contain NO PCB's.
 - All film foil construction
 - **Two** (2) bushings
4. Capaditor losses shall not exceed 0.2 watts/KVAR. This value is based upon being energized at rated voltage in a 40° C ambient temperature.

5. The internal corona starting voltage or ionization level shall not be less than 180% of rated voltage at 25" C.
6. Each capacitor design shall have successfully passed the design test described in **ANSI C55.1** (latest revision).
7. All units shall successfully pass a test where d.c. voltage at **4.3** times the capacitor-rated voltage is applied for 10 seconds minimum.

C. GENERAL REQUIREMENTS FOR ASSEMBLIES

1. Equipment shall be preassembled and wired ready for raising into place and bolting to the pole.
2. Equipment shall be capable of being installed in conformance with California G.O. 95 as received from the vendor.
3. Cantilever strength of the rack shall provide a safety factor of five (5).
4. Rack material shall be steel conforming to **ASTM A36** (latest revision) with hot-dipped galvanized finish per **ASTM A153** (latest revision).
5. Bushing air clearances between individual units shall be **six (6)** inches minimum, phase-to-phase and phase-to-ground.
6. Banks shall be wired in a floating (ungrounded) ~~Wye~~ and have a bare loop approximately three (3) inches long at each end of the neutral bus to permit attachment of grounds when required.
7. Bus wiring shall have 5-kv minimum insulation.

D. SPECIAL REQUIREMENTS FOR SWITCHED ASSEMBLIES

1. Switches shall be rated for capacitor switching up to 1200 KVAR banks (400 KVAR per switch). Switches shall have terminal covers.

2. Oil switches **must** be electrically and mechanically interchangeable and supplied with 5-conductor plug and receptacle. Control wiring to be factory assembled with switch controls wired and terminated on a terminal board located in a weatherproof, frame-mounted junction box. Acceptable oil switches are:

Westinghouse	CSR
General Electric	9F90DBF142

3. Capacitor switches shall be insulated from the rack by means of stand-off insulators. Minimum creepage of capacitor switch insulators shall be ten (10) inches.
4. Means for grounding the switch tanks only shall be provided.
5. Grounding connector for switch tank shall be of a material compatible with switch tank finish.
6. Ground lead shall consist of 600-volt insulated copper, minimum of No. 6 AWG and shall be insulated from the rack with Schedule 80 PVC conduit.
7. Switch leads shall have three (3) inches bare section on load side to permit attachment of grounds when required.

E. QUOTATION AND DRAWING REQUIREMENTS

1. For evaluation purposes, each bid shall be accompanied by the following information for each capacitor unit:
 - a. Loss versus temperature.
 - b. Capacitance versus temperature.
 - c. Corona starting voltage versus temperature.
 - d. Maximum and average watts loss from actual production.
 - e. Safe time versus current plots or allowable i^2t values.
 - f. Dielectric stress in volts/mil.

- g. Number of series - parallel sections and the section voltage at rated voltage operation.
 - h. Results of all required tests.
2. Complete descriptive data with proposed drawings for all included equipment shall accompany the proposal.
 3. Approval drawings are required. Two (2) sets of final drawings and instruction manuals shall be provided by the supplier.
 4. Bidders shall submit information as to the chemical content of all **fluids** used within the capacitor units offered in this proposal. Absolutely no PCB's or any fluids containing any form of chlorinated benzenes, currently under investigation by the EPA, will be accepted.